

history of atomic models

http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/59229/Bohr_Nav.swf::The%20Bohr%20Atom

Review Thermal

Intro to Atomic and Nuclear Physics

Thermal - sum of kinetic and potential energy of the particles (atoms/molecules) that make up an object.

Temperature - the average kinetic energy of the particles that make up an object. How hot or cold something is.

Kelvin to Celcius add 273°C
zero Kelvin is -273°C and absolute zero - no kinetic energy in the particles.

Heat - energy flowing due to the difference in temperature.

the heat can cause a change of state or a change in

temperature.

$Q = mH$ H is latent heat find on tables

$Q = mc\Delta T$ for changes in temperature

c is specific heat capacity

Laws of Thermodynamics

Zero - heat flows from hot to cold

First - energy is conserved

Second - Entropy (randomness) increases

p255 Q16

a) Solidifying releases heat

$$Q = m H_f$$
$$= 0.175 \text{ kg} (2.04 \times 10^4 \frac{\text{J}}{\text{kg}})$$
$$= 3570 \text{ J}$$

$$Q = mc\Delta T$$
$$\Delta T = \frac{35070 \text{ J}}{0.055 \text{ kg} (4180 \frac{\text{J}}{\text{kg}^\circ\text{C}})}$$
$$= 16^\circ\text{C}$$

$$T_f = 16^\circ\text{C} + 20^\circ\text{C}$$

$$= \boxed{36^\circ\text{C}}$$

b) $\ominus Q_{\text{lead}} = Q_w$

$$0,175 \text{ kg} \left(130 \frac{\text{J}}{\text{kg}^\circ\text{C}} \right) (T_E - 327^\circ\text{C})$$

$$= 0,05 \text{ kg} \left(4180 \frac{\text{J}}{\text{kg}^\circ\text{C}} \right) (T_E - 36^\circ\text{C})$$

$$m_H - mc\Delta T = mc\Delta T$$

$$-22 - 75T_E + 7439.25 = 229.9T_E$$

$$-7524$$

$$-8270.4$$

~~$$14743.25 - 221.75T_E$$~~

$$15715.65 = 251.65T_E$$

$$T_E = 62^\circ\text{C}$$

p262 Review Problems 2, 4, 9, 18, 22, 25

Good topics:

Dark Energy

Dark Matter

Measuring Radiation

Harmful Effects of Radiation

Biological Uses of Radiation

The Advantages of Using Nuclear Energy

The Disadvantages of Using Nuclear Energy

Fission Reactor types

Nuclear Weapons

Fusion Reactors types

Particle Accelerators (Triumph at UBC or CERN or pick another one)

The Manhattan Project

Nuclear Fallout

Radioactive Wastes

Neutrinos

Chernobyl

Fukushima

Standard Model

Feynman Diagrams

Famous physicists and their discoveries: (Richard Feynman, Einstein,...)

Superconductors

Semiconductors and diodes

Black Holes(focus on relativity)

Negative Refraction

SuperNova Research (at Triumph?)

String Theory vs Quantum Gravity

Heisenburg Uncertainty Principle

Heisenburg's role in Second World War

Schrödinger Equation

Nobel Prizes in Physics

Irradiated foods

Physics in Movies

Physics in the News (<http://physicsweb.org/>)

Higgs Boson

Other topics – run by Mr. Klaassen first